

What is claimed is:

1. A multicast delivery system comprising:
 - a delivery server which enciphers delivery data by using a current use cipher key to generate enciphered data and transmits a multicast packet containing said enciphered data and a current use key identifier indicative of a pair of said current use cipher key and a current use decipher key as current use keys;
 - a key management server which is connected with said delivery server through a network, holds as a current use key data, a set of said current use decipher key and said current use key identifier, and transmits a set of said current use decipher key and said current use key identifier as a current use decipherment key data in response to a current use key data request; and
 - a client terminal which is connected with said delivery server and said key management server through said network, receives said multicast packet from said delivery server, issues said current use key data request to said key management server to receive said current use decipherment key data from said key management server, holds said set of said current use decipher key and said current use key identifier, and deciphers said enciphered data contained in said multicast packet by using said current use decipher

key when said current use key identifier contained in said multicast packet is coincident with said current use key identifier held in said client terminal.

5 2. The multicast delivery system according to claim 1, wherein said delivery server generates and holds as a current use encipherment key data, a set of said current use cipher key, said current use decipher key and said current use key identifier, and transmits
10 a set of said current use decipher key and said current use key identifier as said current use decipherment key data to said key management server, and

 said key management server holds said current
15 use decipher key and said current use key identifier as said current use decipherment key data.

3. The multicast delivery system according to claim 2, wherein said delivery server sets a current
20 use key remaining effective time data to said current use key data, and transmits a set of said current use decipher key, said current use key identifier, and said current use key remaining effective time data as said current use decipherment key data to said key
25 management server,

 said key management server holds said current use decipherment key data, and

said delivery server, said key management server and said client terminal decreases said current use key remaining effective time data as time elapses.

5 4. The multicast delivery system according to claim 3, wherein said delivery server generates as a next use key data, a set of a next use cipher key, a next use decipher key, a next use key identifier indicative of a pair of said next use cipher key and a
10 next use key remaining effective time data, when said current use key remaining effective time data becomes a first present value, and transmits a set of said next use decipher key, said next use key identifier, and said next use key remaining effective time data to
15 said key management server as a next use decipherment key data, and

said key management server holds said next use decipher key data.

20 5. The multicast delivery system according to claim 4, wherein said client terminal issues a next use key request to said key management server when said current use key remaining effective time data becomes a second present value smaller than said first
25 preset value, and receives and holds said next use decipherment key data from said key management server.

6. The multicast delivery system according to claim 5, wherein said delivery server enciphers said delivery data by using said next use cipher key as said current use cipher key after said current use key
5 remaining effective time data becomes 0.

7. The multicast delivery system according to claim 1, wherein said delivery server issues a current use key data generating request to said key management
10 server,

 said key management server generates and holds as a current use key data, a set of said current use cipher key, said current use decipher key and said current use key identifier in response to said current
15 use key data generating request, and transmits a set of said current use cipher key and said current use key identifier as a current use encipherment key data to said delivery server, and

 said delivery server holds said current use
20 encipherment key data.

8. The multicast delivery system according to claim 7, wherein said key management server sets a current use key remaining effective time data to said
25 current use key data, and transmits a set of said current use decipher key, said current use key identifier, and said current use key remaining

effective time data as said current use encipherment
key data to said delivery server,

said delivery server holds said current use
encipherment key data, and

5 said delivery server, said key management
server and said client terminal decreases said current
use key remaining effective time data as time elapses.

9. The multicast delivery system according to
10 claim 8, wherein said delivery server issues a next
use key data generating request to said key management
server, when said current use key remaining effective
time data becomes a first present value,

said key management server generates and
15 holds as a next use key data, a set of a next use
cipher key, a next use decipher key, a next use key
identifier indicative of a pair of said next use
cipher key and a next use key remaining effective time
data in response to said next use key data generating
20 request, and transmits a set of said next use encipher
key, said next use key identifier, and said next use
key remaining effective time data to said delivery
server as a next use encipherment key data, and

said delivery server holds said next use
25 encipherment key data.

10. The multicast delivery system according to

claim 9, wherein said client terminal issues a next use key request to said key management server when said current use key remaining effective time data becomes a second present value smaller than said first
5 preset value, and receives and holds said next use decipherment key data of said next use decipher key, said next use key identifier, and said next use key remaining effective time data from said key management server.

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11. The multicast delivery system according to claim 10, wherein said delivery server enciphers said delivery data by using said next use cipher key as said current use cipher key after said current use key
15 remaining effective time data becomes 0.

12. The multicast delivery system according to claim 1, further comprising:

a plurality of said delivery servers; and
20 a plurality of said client terminals,
wherein each of said plurality of delivery server issues a next use key data generating request to said key management server while using said current use cipher key,
25 said key management server generates and holds as a next use key data, a set of a next use cipher key, a next use decipher key and a current use

key identifier indicative of a pair of said next use cipher key and said next use decipher key in response to said next use key data generating request, and transmits a set of said next use cipher key and said next use key identifier as a next use encipherment key data to said delivery server, and

said delivery server holds said next use encipherment key data.

10 13. The multicast delivery system according to claim 12, wherein each of said plurality of client terminals issues a next use decipher key request to said key management server when said client terminal does not hold said current use key identifier
15 contained in said multicast packet,

said key management server transmits a set of said next use decipher key and said next use key identifier to said client terminal as a next use decipherment key data, and

20 said client terminal holds said next use decipherment key data.

14. The multicast delivery system according to claim 12, wherein each of said plurality of delivery servers issues a key data change previous notice to
25 said plurality of clients,

each of said plurality of client terminals

issues a next use decipher key request to said key management server in response to said key data change previous notice,

5 said key management server transmits a set of said next use decipher key and said next use key identifier to said client terminal as a next use decipherment key data, and

said client terminal holds said next use decipherment key data.

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15. The multicast delivery system according to claim 1, further comprising:

a plurality of said delivery servers; and
a plurality of said client terminals,

15 wherein said key management server comprises:
a master server; and
a plurality of slave servers,

wherein each of said plurality of delivery servers issues a next use key data generating request
20 to said master server while using said current use cipher key,

said master server generates and holds as a next use key data, a set of a next use cipher key, a next use decipher key and a current use key identifier
25 indicative of a pair of said next use cipher key and said next use decipher key in response to said next use key data generating request, transmits a set of

said next use cipher key and said next use key
identifier as a next use encipherment key data to said
delivery server, and transmits a set of said next use
decipher key and said next use key identifier as a
5 next use decipherment key data to said plurality of
slave servers,

each of said plurality of slave servers holds
said next use decipherment key data, and

said delivery server holds said next use
10 encipherment key data.

16. The multicast delivery system according to
claim 15, wherein each of said plurality of client
terminals issues a next use decipher key request to
15 any of said plurality of slave servers when said
client terminal does not hold said current use key
identifier contained in said multicast packet,

said slave server transmits said next use
decipherment key data to said client terminal, and
20 said client terminal holds said next use
decipherment key data.

17. The multicast delivery system according to
claim 15, wherein each of said plurality of delivery
25 servers issues a key data change previous notice to
said plurality of clients,

each of said plurality of client terminals

issues a next use decipher key request to any of said plurality of slave servers in response to said key data change previous notice,

said slave server transmits said next use
5 decipherment key data to said client terminal, and

said client terminal holds said next use decipherment key data.

18. The multicast delivery system according to
10 claim 1, wherein said key management server detects a data amount of said multicast packets and charges a fee to said client terminal based on said detected data amount.

15 19. The multicast delivery system according to claim 1, wherein said client terminal issues said key data request to said key management server, and
said key management server detects the number of said key data requests and charges a fee to said
20 client terminal based on said detected number of key data requests.

20. A delivery server in a multicast delivery system, comprising:

25 a key data management table which holds a current use cipher key and a current use key identifier for said current use cipher key; and

an enciphering section which refers to said
key data management table to acquires said current use
cipher key, enciphers delivery data by using said
current use cipher key to generate enciphered data and
5 transmits a multicast packet containing said
enciphered data and said current use key identifier
indicative of a pair of said current use cipher key
and a current use decipher key as current use keys.

10 21. The delivery server according to claim 20,
further comprising:

a key managing section which generates as a
current use encipherment key data, a set of said
current use cipher key, said current use decipher key
15 and said current use key identifier, stores said
current use cipher key and said current use key
identifier in said key data management table, and
transmits a set of said current use decipher key and
said current use key identifier as a current use
20 decipherment key data to a key management server.

22. The delivery server according to claim 20,
further comprising:

a key managing section which generates as a
25 current use encipherment key data, a set of said
current use cipher key, said current use decipher key,
said current use key identifier and a current use key

remaining effective time data, stores said current use cipher key, said current use key identifier and said current use key remaining effective time data in said key data management table, and transmits a set of said
5 current use decipher key, said current use key identifier and said current use key remaining effective time data as a current use decipherment key data to a key management server.

10 23. The delivery server according to claim 20, further comprising:

a key managing section which issues a next use key data generating request, and receives and stores a next use cipher key and a next use key
15 identifier in said key data management table.

24. The delivery server according to claim 20, wherein said key data management table stores a current use key remaining effective time data in
20 addition to said current use cipher key and said current use key identifier, and

said delivery server further comprises:

a key managing section which decrease said current use key remaining effective time data as time
25 elapses, issues a next use key data generating request, when said current use key remaining effective time data becomes a first preset value, and receives

and stores a next use cipher key and a next use key identifier in said key data management table.

25. The delivery server according to claim 20,
5 further comprising:

 a key managing section which issues a use key data change previous notice to client terminals, while using said current use cipher key.

10 26. A key management server in a multicast delivery system, comprising:

 a key data management table which holds a current use decipher key and a current use key identifier for said current use decipher key; and

15 a key managing section which reads out said current use decipher key and said current use key identifier in response to a key data request to transmit to a request issuing client.

20 27. The key management server according to claim 26, wherein said key managing section generates as a current use key data, a set of a current use cipher key, said current use decipher key and said current use key identifier in response to a key data
25 generating request, stores said current use key data in said key data management table, and transmits a set of said current use cipher key and said current use

key identifier as a current use encipherment key data to a request generating deliver server.

28. The key management server according to claim
5 27, wherein said key managing section generates as a next use key data, a set of a next use cipher key, a next use decipher key and a next use key identifier in response to a next key data generating request, stores said next use key data in said key data management
10 table, and transmits a set of said next use cipher key and said next use key identifier as a next use encipherment key data to a request generating deliver server.

15 29. The key management server according to claim 26, wherein said key managing section receives said current use decipher key and said current use key identifier from a deliver server, and stores in said key data management table, and receives a next use
20 decipher key and a next use key identifier from said deliver server, and stores in said key data management table.

30. The key management server according to claim
25 26, wherein said key data management table holds a current use key remaining effective time data in addition to said current use decipher key and said

current use key identifier, and

said key managing section decreases said
current use key remaining effective time data as time
elapses, reads out said current use decipher key, said
5 current use key identifier and said current use key
remaining effective time data in response to a key
data request to transmit to a request issuing client.

31. The key management server according to claim
10 30, wherein said key managing section generates as a
current use key data, a set of a current use cipher
key, said current use decipher key, said current use
key identifier and said current use key remaining
effective time data in response to a key data
15 generating request, stores said current use key data
in said key data management table, and transmits a set
of said current use cipher key and said current use
key identifier as a current use encipherment key data
to a request generating deliver server.

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32. The key management server according to claim
30, wherein said key managing section generates as a
next use key data, a set of a next use cipher key, a
next use decipher key, a next use key identifier and a
25 next use key remaining effective time data in response
to a next use key data generating request, stores said
next use key data in said key data management table,

and transmits a set of said next use cipher key and said next use key identifier as a current use encipherment key data to a request generating deliver server.

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33. The key management server according to claim 32, wherein said key managing section reads out said next use decipher key, said next use key identifier and said next use key remaining effective time data in response to a next use key data request to transmit to a request issuing client.

34. The key management server according to claim 30, wherein said key managing section receives said current use decipher key, said current use key identifier and a current use key remaining effective time data from a deliver server, stores in said key data management table, receives a next use decipher key, a next use key identifier and a next use key remaining effective time data from said deliver server, and stores in said key data management table.

35. The key management server according to claim 34, wherein said key managing section transmits a set of said next use cipher key, said next use key identifier and said next use key remaining effective time data as a next use encipherment key data to a

request generating deliver server.

36. The key management server according to claim
26, further comprising a key managing section detects
5 a data amount of said multicast packets and charges a
fee to said client terminal based on said detected
data amount.

37. The key management server according to claim
10 26, further comprising a key managing section detects
the number of said key data requests and charges a fee
to said client terminal based on said detected number
of key data requests.

15 38. A client terminal in a multicast delivery
system, comprising:

 a key data management table which holds a
current use decipher key and a current use key
identifier for said current use decipher key; and

20 a key managing section which issues a current
use key data request to acquire a current use key data
of said current use decipher key and said current use
key identifier, stores said current use key data in
said key data management table, determines whether a
25 transmission key identifier contained in a multicast
packet with an enciphered data is present in said key
data management table, decipheres said enciphered data

by using said decipher key stored in said key data management, when it is determined that said transmission key identifier is present, issues a next use key data request to acquire a next use key data of
5 a next use decipher key and a next use key identifier, when it is determined that said transmission key identifier is not present, and stores said next use key data in said key data management table.

10 39. The client terminal according to claim 38, wherein said key data management table holds a current use key remaining effective time data in addition to said current use decipher key and said current use key identifier, and

15 said key managing section decreases said current use key remaining effective time data as time elapses, issues said next use key data request when said current use key remaining effective time data becomes a predetermined value, acquires said next use
20 key data of said next use decipher key and said next use key identifier, and stores said next use key data in said key data management table.

40. A software product executable by a computer
25 and storing a program executing functions of:

referring to a key data management table to acquire a current use cipher key;

enciphering delivery data by using said
current use cipher key to generate enciphered data;
and

transmitting a multicast packet containing
5 said enciphered data and said current use key
identifier indicative of a pair of said current use
cipher key and a current use decipher key as current
use keys.

10 41. The software product according to claim 40,
wherein said program further executes the functions
of:

generating a current use encipherment key
data of said current use cipher key, said current use
15 decipher key and said current use key identifier;

storing said current use cipher key and said
current use key identifier in said key data management
table; and

transmitting a set of said current use
20 decipher key and said current use key identifier as a
current use decipherment key data to a key management
server.

42. The software product according to claim 40,
25 wherein said program further executes the functions
of:

generating a current use encipherment key

data of said current use cipher key, said current use decipher key, said current use key identifier and a current use key remaining effective time data;

storing said current use cipher key, said
5 current use key identifier and said current use key remaining effective time data in said key data management table, and transmits a set of said current use decipher key, said current use key identifier and said current use key remaining effective time data as
10 a current use decipherment key data to a key management server.

43. The software product according to claim 40, wherein said program further executes the function of:
15 issuing a next use key data generating request, and receives and stores a next use cipher key and a next use key identifier in said key data management table.

20 44. The software product according to claim 40, wherein said program further executes the functions of:

storing a current use key remaining effective time data in addition to said current use cipher key
25 and said current use key identifier in said key data management table;

decreasing said current use key remaining

effective time data as time elapses;

issuing a next use key data generating request, when said current use key remaining effective time data becomes a first preset value; and

5 receiving and storing a next use cipher key and a next use key identifier in said key data management table.

45. The software product according to claim 40,
10 wherein said program further executes the functions of:

issuing a use key data change previous notice to client terminals, while using said current use cipher key.

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46. A software product executable by a computer and storing a program executing functions of:

storing a current use decipher key and a current use key identifier for said current use
20 decipher key in a key data management table; and

reading out said current use decipher key and said current use key identifier in response to a key data request to transmit to a request issuing client.

25 47. The software product according to claim 46, wherein said program further executes the functions of:

generating as a current use key data, a set of a current use cipher key, said current use decipher key and said current use key identifier in response to a key data generating request; and

5 storing said current use key data in said key data management table, and transmits a set of said current use cipher key and said current use key identifier as a current use encipherment key data to a request generating deliver server.

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48. The software product according to claim 47, wherein said program further executes the functions of:

generating as a next use key data, a set of a
15 next use cipher key, a next use decipher key and a next use key identifier in response to a next key data generating request;

storing said next use key data in said key data management table; and

20 transmitting a set of said next use cipher key and said next use key identifier as a next use encipherment key data to a request generating deliver server.

25 49. The software product according to claim 46, wherein said program further executes the functions of:

receiving said current use decipher key and
said current use key identifier from a deliver server;
storing in said key data management table;
receiving a next use decipher key and a next
5 use key identifier from said deliver server; and
storing in said key data management table.

50. The software product according to claim 46,
wherein said program further executes the functions
10 of:

storing a current use key remaining effective
time data in addition to said current use decipher key
and said current use key identifier in said key data
management table; and
15 decreasing said current use key remaining
effective time data as time elapses; and
reading out said current use decipher key,
said current use key identifier and said current use
key remaining effective time data in response to a key
20 data request to transmit to a request issuing client.

51. The software product according to claim 50,
wherein said program further executes the functions
of:
25 generating as a current use key data, a set
of a current use cipher key, said current use decipher
key, said current use key identifier and said current

use key remaining effective time data in response to a key data generating request;

storing said current use key data in said key data management table; and

5 transmitting a set of said current use cipher key and said current use key identifier as a current use encipherment key data to a request generating deliver server.

10 52. The software product according to claim 50, wherein said program further executes the functions of:

generating a next use key data of a next use cipher key, a next use decipher key, a next use key
15 identifier and a next use key remaining effective time data in response to a next use key data generating request;

storing said next use key data in said key data management table; and

20 transmitting a set of said next use cipher key and said next use key identifier as a current use encipherment key data to a request generating deliver server.

25 53. The software product according to claim 52, wherein said program further executes the functions of:

reading out said next use decipher key, said
next use key identifier and said next use key
remaining effective time data in response to a next
use key data request to transmit to a request issuing
5 client.

54. The software product according to claim 50,
wherein said program further executes the functions
of:

10 receiving said current use decipher key, said
current use key identifier and a current use key
remaining effective time data from a deliver server;
storing in said key data management table;
receiving a next use decipher key, a next use
15 key identifier and a next use key remaining effective
time data from said deliver server; and
storing in said key data management table.

55. The software product according to claim 54,
20 wherein said program further executes the functions
of:

transmitting a set of said next use cipher
key, said next use key identifier and said next use
key remaining effective time data as a next use
25 encipherment key data to a request generating deliver
server.

56. The software product according to claim 46,
wherein said program further executes the functions
of:

detecting a data amount of said multicast
5 packets and charging a fee to said client terminal
based on said detected data amount.

57. The software product according to claim 46,
wherein said program further executes the functions
10 of:

detecting the number of said key data
requests and charging a fee to said client terminal
based on said detected number of key data requests.

15 58. A software product executable by a computer
and storing a program executing the functions of:

storing a current use decipher key and a
current use key identifier for said current use
decipher key in a key data management table; and
20 issuing a current use key data request to
acquire a current use key data of said current use
decipher key and said current use key identifier,
stores said current use key data in said key data
management table;

25 determining whether a transmission key
identifier contained in a multicast packet with an
enciphered data is present in said key data management

table;

deciphering said enciphered data by using
said decipher key stored in said key data management,
when it is determined that said transmission key

5 identifier is present;

issuing a next use key data request to
acquire a next use key data of a next use decipher key
and a next use key identifier, when it is determined
that said transmission key identifier is not present;

10 and

storing said next use key data in said key
data management table.

59. The software product according to claim 58,
15 wherein said program further executes the functions
of:

storing a current use key remaining effective
time data in addition to said current use decipher key
and said current use key identifier in said key data
20 management table;

decreasing said current use key remaining
effective time data as time elapses;

issuing said next use key data request when
said current use key remaining effective time data
25 becomes a predetermined value;

acquiring said next use key data of said next
use decipher key and said next use key identifier; and

storing said next use key data in said key
data management table.

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